The Journal of the South Carolina Native Plant Society



Fall 2007

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Name That Native Plant!

This perennial forb could be called the Cinderella of the native plant world. It arises early in the spring, adopts an unassuming growth habit, with bluish-green leaves, and blooms borne near the ground. One has to look closely to appreciate the beauty of the creamy yellow blooms. It is fruiting by late June, and has mature seeds by mid to late July. Then like our heroine, hearing the clock beginning to toll twelve, it heads for the exit in early August, when its leaves begin to darken. By September, she's safely back home underground.



The answer is embedded in the text somewhere in this newsletter. Photo by Bill Stringer.

Native Plant Society and Forest Service Re-invigorate Endangered Pondberry at Honey Hill

by Jeff Glitzenstein

Pondberry (Lindera melissifolia) is a small to medium-sized shrub in the Lauraceae family. (see Figs. 1, 2, and 4). It resembles the common upland tree sassafras, but is shorter with a more densely clonal growth form. In SC pondberry typically occurs along the margins of Carolina Bays and other wet depressions. It generally occupies a relatively narrow zone just interior to larger but less flood-tolerant shrubs, e.g. fetterbush (Lyonia lucida), red bay (Persea *palustris*) and white bay (Magnolia virginiana). However, in the absence of fire, trees and larger shrubs can encroach on the pondberry, and competitively



Figure 1. Pondberry fruits. Photo courtesy of Arkansas Natural Heritage Commission.

exclude it. Due to fire exclusion, land drainage, and loss of wetland habitat, pondberry has been in decline across its entire range (see Fig 3), and is considered endangered by US Fish and Wildlife Service.

One of the largest SC pondberry populations occurs within an extensive lime-sink depression complex near Honey Hill, about 10 miles west of McClellanville, in Francis Marion NF. Here, in the late 1980's, Dr. Douglas Rayner and Pat Ferral mapped over 50 depressions with pondberry, in an area of less than 100 acres. At that time this small area contained 64 of the 73 known colonies, and almost 70% (8000 stems) of the known pondberry plants in SC. In the ensuing decade, pondberry sites and stem numbers at Honey Hill declined dramatically. In a 2001 survey, USFS botanist/ecologist Robin Mackie and Tammy Boyd found only eight colonies and estimated a total of only 300 surviving stems. (NOTE: A <u>colony</u> is a subunit of a population comprising a local aggregate of plants. In a clonal plant like pondberry, many plants in a colony may be associated via rhizomes. A <u>population</u> is defined as the total individuals of

(See **Pondberry**, page 4)

The View From Here

The hot, dry conditions this summer have showcased the sterling attributes of native plants. I've seen native plants along roadsides and in my prairie garden blooming under conditions that have suppressed the growth of non-natives, unless they were watered. Everything "hunkers down" in this kind of weather, but the little rains have brought forth crops of blooms on roadside natives like butterfly milkweed. This could be a good year for warm-season native grasses, because the tall fescue has been so suppressed by the heat and drought, especially if we get rain in September.

SCNPS has made some important contributions to the natural environment of our state this year, in standing up for native habitats in danger from development. Our issues committee has been busy raising public awareness of the danger to the Francis Marion NF from a plan to re-engineer Steed Creek Road in Charleston and Berkeley Counties. The proposed project would have serious negative impacts on a rare and beautiful native longleaf pine habitat on public land. Intact longleaf pine habitat is almost gone in much of the Southeast. John Brubaker has been engaged with the Coastal Conservation League, SC Dept. of Transportation, and others in an attempt to protect this wonderful piece of our natural heritage. (See Steed Creek Rd article this issue).

In January, SCNPS members raised an alarm about the imminent sale of City of Walhalla property on Stumphouse Mountain to a developer. Quick action by a coalition of environmental groups, including SCNPS, in calling public attention to this beautiful segment of the Blue Ridge Escarpment at risk and the ensuing campaign to raise funds from the Conservation Bank and private contributions has resulted in saving in perpetuity this beautiful natural resource. For more info on this site, see a brief article and link at: http:// www.scnps.org/news ups.html.

A small population of rocky shoals spider lily on Stevens Creek in Edgefield County may be on the verge of being protected. SCNPS received an inquiry from the owners of the Parks Mill site in Edgefield County, expressing interest in selling the property. We are working with TNC and other groups and agencies in trying to acquire protection for this site.

We will soon be collecting native grass and forbs seeds for USFS again. We will be collecting for four weekends in a row, starting on October 20. This has been a very successful project for SCNPS and USFS. We provide transportation to collection sites, and everyone is welcome to join in. If you are interested in participating, see itineraries at http://www.scnps.org/ activities_ups.html.



A very big event is developing in SC for native plant enthusiasts all over the country.

A coalition of universities, agencies, and organizations, including SCNPS, will organize and host the 6th Eastern Native Grass Symposium on October 7 – 10, 2008 in Columbia. This meeting is held every other year, and was in Pensylvania in 2006. At this meeting, scientists, practitioners, industry folks and enthusiasts gather to hear research and applied information on every aspect of our eastern native grasslands. There will be presentations, discussion periods, workshops, and field trips devoted to ecology, seed source development, as well as wildlife, landscaping, and industrial applications for native grasses. Everyone is welcome to participate, and more info will be forthcoming as the planning progresses. See announcement at http://www.scnps.org/engs.html.

Thanx, Bill Stringer, President

Proposal to Widen Steed Creek Road in the Francis Marion National Forest

John A. Brubaker, Chairman, Issues Committee, SCNPS

The South Carolina Department of Transportation (SCDOT) is again proposing to widen Steed Creek Road. When introduced in 2002, the first proposal was challenged by SCNPS and the Coastal Conservation League (CCL). Now the plan is back, seemingly reduced in scale, but in fact, even more threatening to the welfare of the Francis Marion National Forest (FMNF) than the original. SCNPS and CCL are again challenging the plan.

The original proposal sought to completely re-engineer and rebuild Steed Creek Road and its bridges, converting the light-duty rural road into a major traffic artery and truck route. That plan was derailed because of unacceptable adverse impact upon the FMNF, particularly the federallyendangered red-cockaded woodpecker (RCW). Well represented by attorney Eric Glitzenstein, SCNPS took the lead in bringing that fact to the attention of the applicant. The resubmitted plan is a creative attempt to circumvent that criticism. It has been re-submitted as a seemingly scaled-back "road improvement", and does significantly reduce immediate impact on RCW colony trees. But this

(See Steed Creek, page 6)

www.Namethatplant.net: A Website with a Difference by Wesley Burnett

Most field guides and identification manuals have a pretty picture of each plant in flower and growing under optimal conditions. That's fine if the plant you have in hand is in flower and growing under optimal conditions; however, if that is not the case, you may have a problem. The plant in hand may not look like the one in the book. In fact, it may look suspiciously like several other things. South Carolina Native Plant Society's very own Janie Marlow is developing a new web site, Native and Naturalized Plants of the Carolinas (www. namethatplant.net) that is intended to solve the problem of identification given the vagaries of plant morphology. For each entry, Janie is attempting to gather photographs from various locations and various seasons.

The task is impossible, of course. Photographing all plants, common and rare, under all conditions simply can't be done, but Janie has gone a long way toward accomplishing the impossible. She has taken most of the photographs herself, but other photographers and botanical experts have contributed as well. These photographers are identified and have agreed that their photographs can be downloaded and used for non-profit educational purposes so long as the photos are properly credited. Some of the photographs are included because they are beautiful. Others are included because they are diagnostic and are intended to answer the question: what does the plant look like in October after the first frost? Or in January when the woods are silent and asleep?

For each plant, the alternate scientific names are given, along with the authority using the name and citations to further information about the plant. There is a summary of South Carolina's native plant communities adapted from Porcher and Rayner's A GUIDE TO THE WILD-FLOWERS OF SOUTH CARO-

LINA. Janie includes a dictionary of botanical terms that is nearly exhaustive as well as a comprehensive list of published guides covering our region. There are links to other authoritative sites concerned with plant identification and conservation. It is an impressive array; perhaps overwhelming.

Neither does Janie confine herself to the natives. She pays attention to the enemy: the exotic and invasive. She does, however, draw a reasonable distinction between the really nasty stuff and those plants that have become naturalized, an inoffensive and unavoidable part of our environment. But she encourages use of our natives for ornamental purposes and identifies those that are now commonly used in gardening and the authority that has recommended their use. She also has a list of places to visit where native plants are most easily seen and the lists of what can be found there. This section can be expected to grow as more protected places develop and make available species lists.

The major difference between Janie's site and other plant identification sites is her plethora of photographs. The accompanying stuff simply adds to the usefulness of the photographs. But there is another important difference. Janie's site is a "talkie." Botany is just jammed with those awful unpronounceable Latin names. There are many guides to pronunciation, but try as though you might, you know you're missing by a mile and when you finally hear it pronounced by an expert, you're glad you didn't embarrass yourself by trying your version in public. Well, Janie has included the voices of experts giving the proper pronunciation of that soup of Roman syllables.

Ah, but hold on a second, you say. You know Janie to be a graphic designer and a very good one at that, but she is no botanist. Well, an amateur botanist and a pretty serious one, but still she's no professional. Janie is

quick to admit this and has solved the problem by working with most of our area's authoritative and professional experts. If there is the slightest doubt about any name or fact she's had it checked out and confirmed probably more than once, and that voice speaking to you may well be that of Bill Stringer or Doug Rayner or Jan Haldeman.

Ianie is appreciative of all the help she has gotten, but it is her talents as a graphic designer that makes the site so special. The layout is beautiful. The colors are bright without being garish, the text easy to read. There is generally more than one path to get between different locations. The site is easy to use and the user is seldom stranded out there in cyberspace: Janie supplies ample and clear directions along the way. But it is large and complicated site. so it takes a little wandering around to become familiar with its potential. That wandering around is no waste of time. There is something new and exciting on every page.

Janie Marlow is to be thanked and praised for producing this resource for our use and enjoyment. It has been a long laborious task, but a task of exceptional love and devotion as well.

The Journal of the South Carolina Native Plant Society

Published quarterly Editor: Bill Stringer Design Editor: Charlene Mayfield Upstate Chapter - Greenville Lowcountry Chapter -Charleston Midlands Chapter - Columbia Piedmont Chapter - Rock Hill

www.scnps.org

Pondberry, from page 1

a species in an area among which genetic exchange can occur.)

In May 2002, SCNPS got a grant of \$7000 from National Wildlife Federation's Keep the Wild Alive Grant Program. This program funds recovery efforts for federally endangered plant and animal species. This grant funded a detailed population inventory of pondberry at Honey Hill. Then, to reduce competition against the pondberry plants, SCNPS members and USFS workers began clearing gaps around surviving pondberry clusters. Shrubs were clipped and sub-canopy trees were felled. USFS smokejumpers and SCNPS member John Brubaker also felled several large pines to create one particularly large gap. Initial clearing work was done from June 2002 through April 2003. In February 2005 I cleared another sizable section. During this past winter and spring 2007, USFS contributed additional funds for hand clearing. This allowed Donna Streng and me to re-treat some of the older gaps and to clear around most of the remaining untreated clusters.

The pre-treatment survey data were collected during summer and autumn 2002. Plants (defined as a relatively tight cluster of stems) were counted and tagged and clusters of plants were mapped for ease of locat-

ing in subsequent years. The length of each stem was measured. The inventory was repeated using the same methods during each of the following three years, with funds from USFS. The 2003-2005 results can be consid-



Figure 3. Distribution of pondberry in South Carolina, Courtesy of SC Plant Atlas – Barnwell & Dorchester added by Jeff Glitzenstein.



Figure 2. Pondberry flowers. Photo courtesy of Gulf South Research Corporation

ered as post-treatment data, recognizing that additional clearing was going on throughout this period.

In summarizing the data I did not focus on individual stem survival. A clonal plant can be likened to an underground tree, in that above-ground stems are akin to branches, instead of individual plants. Typically, populations of clonal plants are extremely dynamic, with very high turnover rates as stems die back and re-sprout in response to variations in light and moisture environment. The data show total stem numbers for each year. I also present a somewhat unusual type

of data I refer to as "total stem length". This quantity is simply the length of all stems summed across the population as a whole. It is analogous to the well known forestry

measure of <u>stand basal area</u>, except that we are summing <u>stem lengths</u> instead of <u>cross sectional areas</u>. NOTE: See Definition of Basal Area, on next page.

Results are shown graphically in Fig. 5. Stem numbers declined in the year after treatments began, recovered somewhat in the following year, and then increased greatly in 2005. In that final census year the total stem numbers were approximately 9% higher than before the treatments began. The initial decline may have been related to transpiration shock from opening the canopy, or physical damage during treatments, or from clones reallocating resources to better take advantage of reduced shading. Results for total stem length clearly indicated that the population as a whole had benefited from the treatments. This measure of population health has increased in each year since treatments began, with the rate of increase accelerating over time. By 2005, total stem length had increased approximately 119% over the pretreatment total. Other results not shown, related to size distribution analysis, clearly indicated a growing population of increasingly larger stems.

Our efforts to re-invigorate the Honey Hill Lime-sinks pondberry population are working. The population is no longer in danger of disappearing due to excess shade and competition, as appeared to be the case before treatments began. The USFS is planning removal of loblolly pine and small diameter hardwoods in the area to restore longleaf and oak communities and improve the health of the pondberry populations. However, a serious new threat has arisen, not just to pondberry, but to all Lauraceae. The combination of a new alien vector, the redbay ambrosia beetle (*Xyleborus glabratus*) and a deadly fungal pathogen, *Raffaelea* sp., is currently decimating redbay (*Persea borbonia*) in coastal FL, GA and SC. This disease, the so-called laurel wilt,

has been shown in the laboratory to cause mortality of the other Lauraceae as well,



Figure 4. Pondberry (Lindera mellisifolia) Photo by Todd Crabtree, Tenn. Heritage Program

What's this about basal area?

Foresters use the term <u>basal area</u> to describe forest stocking density. The basal area of an individual tree is the area (in² or ft²) of the stump of the tree if it were cut off at <u>breast height</u> (4.5 ft). Remember, Area = π r², where π = 3.1416, and r = ½ the diameter. Thus a tree 12 inches in diameter at breast height (DBH) has a basal area of 3.1416 times 36, or 113 in². Dividing 113 in² by 144 in² gives us 0.78 square feet of basal area. A tree stand with 100 similar sized trees would have basal area of 78 square feet per acre. And that's basal area.

PS: Basal area is closely correlated with photosynthetic surface area in the forest tree canopy.

New Chapter on the Horizon!

The folks in the Beaufort area recently held a very successful chapter kick-off meeting. They had 50 in attendance, and have identified 8 people interested in taking on leadership positions in the new chapter. The meeting was pulled together by Gail Clark of Beaufort, who moved to the area from Modesto, CA several years back, where she was involved in organizing a chapter of the California NPS. They are considering Coastal as their chapter designation in the Society. A plant sale is already in the planning stages for 2008. They are excited about representing our organization in the Beaufort-Hilton Head area. Welcome aboard, Coastal, and let us know how we can help!

including pondberry. Hopefully our efforts to re-invigorate the Honey Hill population will not be for naught.

Editor's Note: For more info on pondberry, go to: http://www.gsrcorp. com/tes/LIME7/LIME7_text.html



Figure 5. Population trends in response to clearing treatments

Fall Native Seed Collection Program

SCNPS has been collaborating with the US Forest Service in SC to make seed supplies of local ecotypes of native grasses available. USFS has shifted to an almost all-natives approach to restoring disturbed sites in the Forests. We will be taking volunteers into the Oconee-Pickens-Greenville area, the York-Union-Newberry area, the Greenwood-Abbeville-McCormick-Edgefield area during the Oct. 20 - Nov. 4 period, and into the Lowcountry area around the Francis Marion NF on Nov. 9 - 11. If you would like to participate, go to the SCNPS website at http://www.scnps.org/activities_ups. html for details.

Steed Creek, from page 2

so-called "improvement" is the classic wolf in sheep's clothing. The plan has been reduced in scale from the original, but calls for the transfer of ownership from the Forest Service to SCDOT of a 132 ft. wide right-of way.

Presently Steed Creek Road is part of the FMNF, public land managed by the US Department of Agriculture Forest Service (USDA-FS). USDA-FS regulations provide for significant public involvement, in addition to rigid rules intended to protect the Forest. Berkeley and Charleston Counties have easements permitting them to maintain Steed Creek Road in its present form, but any changes would require USDA-FS approval. If the Steed Creek Road corridor is transferred to SCDOT, it would lose its USDA-FS protection. If the rightof-way is transferred, SCDOT could conceivably scrap the proposal under review, and elect to construct a 4-lane highway from the start. With the exception of Steed Creek Road, SC-DOT has rights-of-ways on all critical highways in the area.

Development within the FMNF footprint (see Fig. 1), on the scale of that which presently surrounds the Forest, would doom the natural communities within the Forest. Yet this scale of development will surely come, if the current SCDOT proposal is executed. At least 1/3 of the property within the FMNF footprint is privately owned. Unbridled industrial and residential development has already advanced to the Forest's borders. This proposal violates the basic premise that the Forest is a resource to be protected and preserved because of its value as a remnant of our natural heritage. Long-bract false indigo, Baptisia bracteata. And the FMNF is an irreplaceable natural resource, in that it represents a large percentage of the remaining longleaf pine ecosystem that once dominated the Southeastern coastal plain.

The health of the FMNF is presently in serious decline. Virtu-

ally all of the plant communities within the boundaries of FMNF are fire-dependent. (See article on native orchids along Steed Creek Rd in the Spring 2007 issue.) Without fire, the most important existing elements, including Federally Endangered plants and animals, will be lost. FMNF burn management personnel tell us now that vehicular traffic and adjacent development are the greatest obstacles to their fire management program. Increased traffic on Steed Creek Road would only exacerbate this already compromised condition. We have witnessed that situation in the vicinity of the two adjacent improved highways, SC41 and US 17. Today, mandates so severely restrict controlled burning along those corridors that once thriving populations of Federally Endangered species have disappeared from several locations adjacent to those highways. It was not so long ago that SC41 and US17 were narrow, lightly traveled rural roads as Steed Creek is today.

Steed Creek Road is the only real obstacle to providing the infrastructure that developers need to urbanize any quarter within the FMNF footprint. It is a mystery as to why the USDA-FS seeks to open this gate that will lead to the form of land use that will destroy the forest. The position that agency has assumed, however, makes it perfectly clear that survival of the FMNF hinges on those of us who love FMNF taking a stand to defend our national treasure. Your voice will be very important to the fate of Steed Creek Road and the future of the Francis Marion National Forest.

Please refer to the ISSUES section of the SCNPS web page, http://www.scnps.org/issues.html , for further information.

New SC Secretary of Transportation Buck Limehouse recently initiated negotiations with CCL and SC-NPS. We are presently working with SCDOT engineers on a compromise plan that satisfies SCDOT highway standards without compromising critical ecosystems of the FMNF. This is a challenging task, and the outcome is far from certain. Regardless we are indebted to Mr. Limehouse for bringing us together in an effort to resolve the matter.



Controlling Kudzu Without Herbicides

The Kudzu Coalition, Photos by Bill Stringer

Kudzu (Pueraria montana) was first introduced into the US in 1876 at the Philadelphia Centennial Exposition. It was later brought in by several Federal and State agencies, where it was touted for forage, erosion control and ornamental use. The USDA distributed millions of propagules (crowns) in the '30s for erosion control. Having no natural enemies here, kudzu has prospered and become one of the most invasive plants in the country. Its trailing viny habit enables it to grow over trees or structures with its large leafy canopy. It is not known just how long an undisturbed kudzu infestation will persist.

Spartanburg's Kudzu Coalition was formed in October, 2004, to combat kudzu in urban Spartanburg County. The Coalition was the brainchild of Newt Hardie, a Master Gar-

dener and member of the Spartanburg Men's Garden Club. Newt decided to tackle rescuing a grove of cherry trees on S. Pine St. from kudzu, to fulfill the community service requirement for his Master Gardener certification. He had watched kudzu move in on the trees from a nearby railroad bank. Herbicidal control

was not an option, for fear of damaging the trees, so he experimented with non-chemical approaches. Newt and his colleagues noted hundreds of kudzu infestations around Spartanburg, and decided to declare war on the vine. They decided to pursue nonherbicidal methods, so they studied the life habits of kudzu, and learned what "makes it tick" so well. And the rest, as they say, "is history".

Kudzu is a perennial trailing vine that puts down roots wherever a node

touches the ground. Vines can grow several feet a day. Undisturbed nodes will enlarge to form a crown, which bears buds that can then generate new vines. The roots under a crown will enlarge into an energy storage site, in which the plant stores starch for the next season's start-up. (Fig. 1) However, the roots have no buds, so no regrowth comes from severed roots. With this information in mind, the Coalition has experimented with a number of cultural alternatives, with a goal of control, rather than eradication. These include some laborintensive approaches dealing with one kudzu crown at a time, as well as "weapons of mass destruction", that are designed for large infestations. The methods fall into four basic categories: Surgical; Gapping; Barriers; and Thermal.



Fig. 1 A crown and root that formed from from a node on last year's vine.

tween the vine's nodes and its roots and crowns. The Coalition has shown that severing the crowns will kill the plant without having to dig the roots. In this method, a volunteer follows the vine to the crown, node by node, cutting the vine between nodes, and severing the nodes from their roots (Fig 1). A pruning saw, prong-hoe or sharp mattock is used to sever the roots from the crowns just below the soil surface.

Early work

Surgical approach,

which attacks the

focused on the

connection be-

It is a labor-intensive approach, and requires many motivated volunteers to be effective. A recent refinement of this surgical approach, labeled the "kudzu chop", involves grasping the vine close to the crown and using the mattock to sever the crown. An ener-



Fig. 2 The twining habit of kudzu that enables it to climb up and over objects.

getic volunteer can destroy more than 100 crowns per hour with this method. The effectiveness of this method is shown when no kudzu returns the following year.

The Gapping method controls kudzu that is smothering trees. This approach is based on the finding that unsupported kudzu vines can't reach any higher than 3 ½ feet, but climb into trees by twining around anything that can provide vertical support (Fig. 2). Severing climbing vines at that level leaves the vines above without root support, so they die. Then cutting the vines and any other standing vegetation off close to the ground removes any support that kudzu could use to "scaffold" back up protects the tree from renewed attack (Fig. 3). This method has proven effective in rescuing trees that are in danger of being smothered by kudzu. It can be followed up with surgical attack on kudzu crowns to effect eradication.

The Barrier approach is related to the same concept as gapping. Kudzu has no clasping tendrils, and depends on twining around upright objects to climb. It has been shown that kudzu vines cannot twine around a diameter of greater than 8 inches. Use of plastic mesh (Fig. 3) to create barriers with greater than 8 inches effective

(See Kudzu, page 8)

Kudzu, from page 7

diameter will prevent vines from climbing trees, utility guy wires, etc. Barrier methods include the kudzu guard (Fig. 3), patented by Jack Callahan, and plastic mesh barrier fences (these can be seen at www.kokudzu.com/ index.html).

Thermal methods are designed to create a very high temperature environment around kudzu

vines. Covering large kudzu patches with heavy-duty plastic sheeting raises the temperature around the vines and crowns to 140 - 150 °F (Fig. 4). It also blocks out light, thus shutting down photosynthesis. A season's use kills about 40% of the plants, according to Clemson and Coalition experiments. Destruction of the foliage makes the patch more accessible for surgical methods. The original idea for this treatment came from the late Dr. Larry Nelson of Clemson. The Coalition is using this polyethylene "tarp" to cover relatively large patches of



Fig 3 Creating a 4 ft gap to remove any "scaffolding" that kudzu vines could gain support for a climb.

kudzu. The sheeting is specially formulated with UV protection and is bought in 20 foot by 100 foot rolls. The sheeting treatment is an established method, with 11 successful sites. Clear sheeting is used on patches in full sun and black sheeting is used in partial shade. Research is continuing on ways to maintain the temperature at night.

The Coalition is also working with

regular mowing as a means for controlling kudzu. Regular defoliation prevents vines from over-running nearby areas and eventually exhausts the plant resources. This squares with decades of observation that kudzu doesn't prosper in pasture areas where it is subject to regular grazing.

The Coalition has found that use of a skid steer loader can facilitate kudzu control on large level areas. Running the fork lift under a dense mat of vines, and then lifting, removes some crowns, and clears the surface for ease of access by volunteers. This facilitates applying surgical and other methods described above.

The Kudzu Coalition is composed of a small group of active volunteers, but expands its work force by reaching out to the community. Several high schools have joined with the Coalition in combating kudzu on and around their campuses as well as in public areas in the city and county. Many students have participated in Coalition events and teachers report positive impacts from their students' participation. In addition, the Coalition holds "Kudzu Kollege" training sessions to teach people the concepts and techniques it has developed. For more info on Coalition activities and to get in on a Kollege training session, go to http://kokudzu.com/Education. html .



Fig 4 Covering kudzu vegetation with plastic creates high temperatures around the vines & crowns.



Return Service Requested



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